Amendments to the Drawings:

The attached replacement drawing sheet makes changes to Fig. 1A and replaces the original sheets with Fig. 1A.

Attachment: Replacement Sheet

REMARKS

I. Status of the Claims

Claims 1-13 are pending in this application, the independent claims being claims 1 and 4. By this Amendment, claims 1-13 are amended.

II. Summary of Action

In the Office Action, the drawings were objected to under 37 C.F.R. §1.83(a) and §1.84(p)(5), and the specification was objected to on formal grounds. Claims 1-3 were objected to as informal, and rejected under 35 U.S.C. §112, second paragraph, as indefinite. Claims 1-13 were rejected under 35 U.S.C. §102(a), as anticipated by Japanese Patent Document No. 2003-160039; claim 1 further was rejected under 35 U.S.C. §102(b), as anticipated by U.S. Patent No. 6,338,017 (Kato), and claims 2-13 further were rejected under 35 U.S.C. §103(a), as unpatentable over the Kato '017 patent in view of Japanese Patent Document No. 07-117655.

Reconsideration and withdrawal of the objections and rejections respectfully are requested in view of the amendments and the following remarks.

III. Drawing Objections

The objection to the drawings under 37 C.F.R. §1.84(p)(5) respectfully is traversed. Applicants submit that the terms ΔFf, ΔFr, ΔPfo, Sf, Sr, Rf, Rr, BEFf and BEFr identified at page 19 of the specification are not reference characters under 37 C.F.R. §1.84(p)(5); each of these terms is described/defined in the text and equations listed at page 19. Applicants submit that one of ordinary skill in the art readily will understand these terms in the context of the present application.

Applicants likewise submit that the term BEF identified at page 20 is not a reference character under 37 C.F.R. §1.84(p)(5). Rather, it is an acronym for Braking Effectiveness Factor (see, e.g., Fig. 5 (the vertical axis) for use of this term in the drawings).

Applicants also submit the terms "BAC" and "HAB" listed at page 21 are not reference characters under 37 C.F.R. §1.84(p)(5). Rather, these terms are acronyms well-known to those of ordinary skill in the art. For example, the acronym BAC ("Braking Assist Control") refers to auxiliary braking control (see, e.g., pages 2 and 6 of the specification). "HAB" is an acronym for "Hydro Assist Braking." (In this regard, Applicants have amended the specification at paragraph [0064] to provide the full name).

Applicants likewise submit that the terms ΔVw, Vws, Gxs, Gxe, Pme and Vwe listed at page 22 are not reference characters under 37 C.F.R. §1.84(p)(5); each of these terms is described/defined in the text and equations listed at page 22. Applicants submit that one of ordinary skill in the art readily will understand these terms in the context of the present application.

The objection to the drawings under 37 C.F.R. §1.83(a) respectfully is traversed. Nevertheless, without conceding the propriety of the objection, Applicants submit herewith one sheet of formal drawings, together with a marked-up copy of the sheet indicating proposed amendments to Fig. 1. The proposed amendments schematically illustrate in black box form braking force generating apparatuses/wheel cylinders of the front and rear wheels, as described in the written specification and recited in the claims. Applicants submit that those skilled in the art readily will appreciate the amended drawings merely to conform to the written disclosure. No new matter has been added.

As to devices used to control the master cylinder pressure and rear wheel cylinder pressure, the Examiner's attention is directed to the hydraulic circuit illustrated in Fig. 1, including buffer reservoirs 38R and 38F, motor driven pumps 42R and 42F, regulation valves 22R and 22F, check valves 44R and 44F, 46R and 46F, 52R and 52F, and the like.

IV. Formal Amendments

The specification has been reviewed and amended to improve its form, including English, spelling, grammar, idiom, syntax and the like, with particular attention to the Examiner's comments. a substitute specification, together with a marked-up version illustrating the formal amendments, are attached hereto. A substitute Abstract also is attached hereto. Applicants believe these amendments obviate the formal objections to the specification. Reconsideration and withdrawal of all formal objections respectfully are requested.

V. Formal Claim Amendments

The formal objections and rejection of claims 1-13 under 35 U.S.C. §112, second paragraph, respectfully are traversed. Nevertheless, without conceding the propriety of the objections and rejection, claims 1-13 are amended to improve their form, with particular attention to the Examiner's comments. Applicants believe the proposed formal amendments obviate the outstanding objections and rejection set forth in the Office Action. Reconsideration and withdrawal of the objections and rejection respectfully are requested.

VI. Claimed Invention

The present invention relates to a novel device and method for controlling braking of a vehicle. In one aspect, as recited in independent claim 1, the claimed invention relates to a device for controlling braking force of a vehicle having front and rear wheels and braking force generating apparatuses provided for each of the wheels. The device executes braking force distribution control by restricting an increase of a braking force on the rear wheels, generated by the braking force generating apparatuses of the rear wheels, to provide a braking force distribution among the front and rear wheels, biased to the front wheels, under a predetermined condition; the device controls the braking force generating apparatuses of the

front wheels to increment a front wheel braking force based on a restricted amount of the braking force on the rear wheels during execution of the braking force distribution.

Thus, in this aspect, the increment of the front wheel braking force (braking pressure PF) during execution of braking force distribution control is determined based on the restricted amount, that is, the decrement of the rear wheel braking force, where the increment in the front wheel braking force and the restricted/decrement amount of the rear wheel braking force are measured relative to the braking forces that would be generated in the respective front and rear wheels in the absence of the braking force distribution control.

In a similar aspect, as recited in independent claim 4, the claimed invention relates to a device for controlling a braking force of a vehicle having front and rear wheels, a braking system generating braking forces on the respective wheels, and at least one sensor monitoring an operational condition of the vehicle, including a detector detecting an amount of a braking action by a driver of the vehicle. The device executes a braking force distribution control in which a braking force on the rear wheels is lowered in comparison with a braking force on the front wheels when an operational condition monitored by a sensor among the at least one sensor satisfies a predetermined condition, wherein the braking force on the front wheels during execution of the braking force distribution control is increased, and wherein a braking force increment on the front wheels beyond a braking force corresponding to the braking action is determined based upon an increment of the braking action by the driver detected by the detector.

In this aspect, the increment of the front wheel braking force during braking distribution control is determined based on an increment of the driver's braking action. In order to appropriately increase the total braking force on the vehicle after the amount of braking force on the rear wheel is restricted during execution of braking distribution control, an increment in the driver's braking action must be reflected in the front wheel braking force

alone - that is, beyond the nominal increase to the front wheel corresponding to the braking action by the driver detected by the detector.

Prior Art Distinguished

Applicants submit the prior art fails to anticipate the claimed invention. Moreover, Applicants submit that there are differences between the subject matter sought to be patented and the prior art, such the subject matter taken as a whole would not have been obvious to one of ordinary skill in the art at the time the invention was made.

A. JP 2003-60039

Initially, the JP '039 published application is not prior art against the present application. The present application claims priority based on Japanese Publication Application No. 2003-103136, filed April 7, 2003. An English-language translation of the JP '136 priority document is submitted herewith to perfect Applicants' claim to priority. The JP '039 reference was published June 3, 2002, after the filing date of the JP '136 priority application. Accordingly, the JP '039 publication does not qualify as prior art under 35 U.S.C. §102(a) or (b).

B. The Kato '017 Patent and JP 07-117655

The Kato '017 patent relates to a brake force distribution control device for automotive vehicles, and discloses a braking force distribution control that is initiated when the decelerations of all the wheels exceed a set value. However, Applicants submit that the Kato '017 patent fails to disclose or suggest at least the above-described features of the claimed invention. Rather, the Kato '017 patent is understood merely to describe a brake force distribution control system that establishes a predetermined relationship between the wheel cylinder pressure of a front wheel and the wheel cylinder pressure of a rear wheel on the basis of a comparison between the wheel speeds of the front and rear wheels. Specifically, a "longitudinal braking force distribution control is designed to bring the rear

wheel braking force into a predetermined relationship with the front wheel braking force dependent upon the difference between the front wheel speed and the rear wheel speed, which restricts the increasing slope of the braking force of the rear wheels, thereby preventing an earlier locked condition of each of the rear wheels" (see col. 6, lines 3-10).

Nowhere is the Kato '017 patent understood to disclose or suggest the feature wherein a braking control system controls braking force generating apparatuses of the front wheels to increment a front wheel braking force based on a restricted amount of braking force on the rear wheels during execution of the braking force distribution, as recited in claim 1.

Nor is the Kato '017 patent understood to disclose or suggest the feature wherein the braking force on the front wheels during execution of the braking force distrubution control is incresased, and wherein a braking force increment in the front wheels beyond a braking force increase corresponding to the braking action of a driver (detected by a detector) is determined based upon an increment of the braking action by the driver detected by the detector, as recited in independent claim 4.

With respect to claims 2, 3 and 5-13, as acknowledged by the Examiner, the Kato '017 patent fails to disclose or suggest the feature that the front wheel braking force is increased by determining an increment in the wheel cylinders of the front wheels based on the braking action by the driver, the pressures in the wheel cylinders of the rear wheel and parameters each indicating braking performances of the respective braking force generating apparatuses of the front and rear wheels, and incrementing pressure in the front wheels cylinders based upon the increment.

The JP '655 reference is cited for its disclosure of these features. Specifically, the Examiner asserts that the JP '655 reference teaches these features in lines 1-4 of the "Purpose" section of the English Abstract. However, Applicants submit that the JP'655 reference fails to disclose or suggest at least the above-discussed features of the claimed invention. Although

the English Abstract of the JP '655 reference states the system is provided "to improve the stability of a vehicle by controlling the brake power distribution for the front and rear wheels so that the power increases on the front tire side," Applicants submit that this statement is misleading. The JP '655 reference teaches a system in which the front wheel braking force is increased depending upon deterioration of yaw directional behaviour of a vehicle. The increase in the front wheel braking force results in a reduction of the front wheel lateral force, which stabilizes a vehicle's yaw attitude against incorrect handling action by a drive. In this regard, the Japanese Abstract uses terminology relating to 'a driver's action.' However, this 'driver's action' refers to driver handling, that is, rotating a steering wheel - not depressing a braking pedal. Accordingly, Applicants submit that the JP '655 reference fails to add anything to the Kato '017 patent that would make obvious the claimed invention.

For the above reasons, Applicants submit claims 1 and 4 are allowable over the prior art.

Claims 2, 3 and 5-13 depend from claims 1 and 4, respectively, and are believed allowable for the same reasons. Moreover, each of these dependent claims recites additional features in combination with the features of its respective base claim, and is believed allowable in it own right. Individual consideration of the dependent claims respectfully is requested.

VII. Conclusion

Applicants believe the present Amendment is responsive to each of the points raised by the Examiner in the Office Action, and submit that the application is in condition for allowance. Favorable consideration of claims 1-17 and passage to issue of the subject application at the Examiner's earliest convenience earnestly are solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

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JAO:CPW/eks

Attachment:
Petition for Extension of Time
Marked-up Copy of Substitute Specification
Clean Copy of Substitute Specification
Replacement Drawing Sheet
English-Language Translation of JP 2003-103136

Date: July 5, 2005

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